

Assignment

Date _____ Period _____

Verify each identity.

1) $\frac{\tan x}{\sec^2 x} = \cos x \sin x$

2) $\sin x \sec x = \frac{1}{\cot x}$

3) $\frac{1 - \csc x}{\csc x} = \sin x - 1$

4) $\frac{\tan x + \cos x}{\sec x} = \sin x + \cos^2 x$

$$5) \frac{\cot x}{\tan^2 x + 1} = \frac{\cos^2 x}{\tan x}$$

$$6) \frac{\cot^2 x}{\csc^2 x + \sec^2 x} = \cos^4 x$$

$$7) \frac{\tan x + \cot x}{\cot x} = \sec^2 x$$

$$8) \tan x \cdot (\csc^2 x - 1) = \frac{1}{\sec x \sin x}$$

Answers to Assignment (ID: 1)

1) $\frac{\tan x}{\sec^2 x}$ Decompose into sine and cosine

$$\frac{\frac{\sin x}{\cos x}}{\left(\frac{1}{\cos x}\right)^2}$$

Simplify

■

3) $\frac{1 - \csc x}{\csc x}$ Decompose into sine and cosine

$$\frac{1 - \frac{1}{\sin x}}{\frac{1}{\sin x}}$$

Simplify

■

5) $\frac{\cot x}{\tan^2 x + 1}$ Use $\tan^2 x + 1 = \sec^2 x$

$$\frac{\cot x}{\sec^2 x}$$

Use $\cot x = \frac{1}{\tan x}$

$$\frac{1}{\tan x \sec^2 x}$$

Use $\sec x = \frac{1}{\cos x}$

$$\frac{\cos^2 x}{\tan x}$$

■

6) $\frac{\cot^2 x}{\csc^2 x + \sec^2 x}$ Decompose into sine and cosine

$$\frac{\left(\frac{\cos x}{\sin x}\right)^2}{\left(\frac{1}{\sin x}\right)^2 + \left(\frac{1}{\cos x}\right)^2}$$

Simplify

$$\frac{\cos^4 x}{\cos^2 x + \sin^2 x}$$

Use $\sin^2 x + \cos^2 x = 1$

■

2) $\sin x \sec x$ Use $\sec x = \frac{1}{\cos x}$

$$\frac{\sin x}{\cos x}$$

Use $\cot x = \frac{\cos x}{\sin x}$

$$\frac{1}{\cot x}$$

■

4) $\frac{\tan x + \cos x}{\sec x}$ Decompose into sine and cosine

$$\frac{\frac{\sin x}{\cos x} + \cos x}{\frac{1}{\cos x}}$$

Simplify

■

7) $\frac{\tan x + \cot x}{\cot x}$ Decompose into sine and cosine

$$\frac{\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}}{\frac{\cos x}{\sin x}}$$

Simplify

$$\frac{\sin^2 x + \cos^2 x}{\cos^2 x}$$

Use $\sin^2 x + \cos^2 x = 1$

$$\frac{1}{\cos^2 x}$$

Use $\sec x = \frac{1}{\cos x}$

8) $\tan x \cdot (\csc^2 x - 1)$ ■ Use $\cot^2 x + 1 = \csc^2 x$

$\tan x \cot^2 x$ Decompose into sine and cosine

$$\frac{\sin x}{\cos x} \cdot \left(\frac{\cos x}{\sin x}\right)^2$$

Simplify

$$\frac{\cos x}{\sin x}$$

Use $\sec x = \frac{1}{\cos x}$

$$\frac{1}{\sec x \sin x}$$

■